

REMARKS

35 USC Section 103 Rejections:

Claims 1-5, 8, and 13-17 were rejected as being unpatentable under 35 USC 103(a) over Oku et al. (U.S. Patent No. 5,882,808) in view of Deith (WO 91/08179).

The Examiner submits that Oku et al. teaches applying an antimicrobial agent to a substrate by providing a ceramic substrate, providing a conventional silica-based glaze containing an antimicrobial agent (silver oxide, silver-containing ion exchange compound), applying the glaze to the substrate and heating to form a finished coating on the substrate (Col. 1, line 50; Col. 2, line 18; Col. 3, lines 3-32; Example 1). Oku et al. does not teach applying the microbial agent with a sol-gel. (Paper #5)

The Examiner submits that Deith teaches applying a silica-based glaze to a ceramic substrate by a sol-gel method, as an alternative to a conventional, high temperature firing glaze, where the glaze is formed providing a sol-gel precursor formulation comprising a host precursor component (TEOS), allowing the formulation to form a sol-gel (which reads on the compounding step), applying the sol-gel to the substrate and heating to temperatures below 800 degrees C to form a finished coating on the substrate (page 3, lines 12-34; Example). (Paper #5)

The Examiner believes it would have been an obvious modification for one skilled in the art to apply the glaze of Oku et al. by the sol-gel method of Deith, where antimicrobial agent is merely added to the sol-gel glaze composition, with the expectation of gaining the additional benefit of providing the desired ceramic glaze layer in Oku et al. at lower heat treating

temperatures than with the conventional glaze of Oku et al., as taught by Deith. However, Oku et al. and Deith do not teach the log kill rate for *Klebsiella pneumoniae*. (Paper #5)

Applicants respectfully submit that this rejection fails to establish a prima facie showing of obviousness, since the combination of references fails to disclose expressly claimed elements or limitations of Applicants' invention. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Applicants respectfully submit that the combination of references specifically fails to teach that the antimicrobial agent is added to the sol prior to the formation of the gel, and that the antimicrobial agent is then present within the formulation during the low temperature heating step (Specification, page 11, lines 4-9). Applicants have disclosed that adding solid antimicrobial agents after the formation of the film results in highly undesirable discolorations of the film. For example, the film will generally exhibit darkening as a result of the high temperatures used in film formation (Specification, bottom page 11 to top of page 12). Accordingly, Applicants have specified this element of their invention in step (b) of claim 1.

Thus, while Oku et al. disclose high temperature glazing techniques for ceramics which include antibacterial and antifungal agents, and Deith discloses low temperature glazing techniques for ceramics and pottery, Applicants respectfully submit that neither reference, either alone or in combination, teaches the ordinary skilled artisan how or when to incorporate an antimicrobial agent into a sol gel composition to create Applicants' inventive film which exhibits excellent antimicrobial properties and lacks highly undesirable discoloration properties.

Additionally, Deith discloses a sol gel method for producing a film which is durable through automatic dishwashing cycles, yet soft enough to fuse over transfers for the purpose of

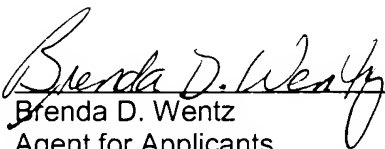
reducing the amount of lead that leaches out during washing (page 2, lines 30-35). It has already been established that Oku et al. fails to disclose the sol gel method of applying glaze to hard surfaces. Thus, Applicants respectfully submit that the combination of references, therefore, could not possibly teach the ordinary skilled artisan how or when to incorporate an antimicrobial agent into a sol gel film for use on hard substrates such as ceramics, plastics, glasses, metals, and the like, to produce a film having excellent antimicrobial characteristics and that lacks undesirable discoloration.

Therefore, since the combination of references fails to disclose expressly claimed elements or limitations of Applicants' invention, Applicants respectfully submit that a prima facie showing of obviousness has not been established. As such, Applicants respectfully submit that this rejection is improper and, since claims 2-5, 8, and 13-17 depend from claim 1, request that the rejection of claims 1-5, 8, and 13-17 be withdrawn.

In view of the above remarks, reconsideration of pending claims 1-5, 8, and 13-17 is earnestly solicited.

Respectfully requested,

July 28, 2003


Brenda D. Wentz
Agent for Applicants
Registration Number: 48,643
(864) 503-1597